



June 06, 2016

Meagan E. Ormand Golder Associates Inc. 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227

RE: Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

# Dear Meagan Ormand:

Enclosed are the analytical results for sample(s) received by the laboratory on June 03, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Nicole Gasiorowski

Micolo Yasicronske

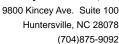
nicole.gasiorowski@pacelabs.com

**Project Manager** 

Enclosures

cc: Ron DiFrancesco, Golder Associates Inc. Martha Smith, Golder Associates Inc. Mike Williams, Golder Associates Inc







# **CERTIFICATIONS**

Project: **BREMO WEEKLY PROCESS** 

Pace Project No.: 92300031

**Ormond Beach Certification IDs** 

8 East Tower Circle, Ormond Beach, FL 32174 Alabama Certification #: 41320

Connecticut Certification #: PH-0216

Delaware Certification: FL NELAC Reciprocity

Florida Certification #: E83079 Georgia Certification #: 955

Guam Certification: FL NELAC Reciprocity Hawaii Certification: FL NELAC Reciprocity Illinois Certification #: 200068

Indiana Certification: FL NELAC Reciprocity

Kansas Certification #: E-10383 Louisiana Certification #: FL NELAC Reciprocity Louisiana Environmental Certificate #: 05007

Maryland Certification: #346

Michigan Certification #: 9911 Mississippi Certification: FL NELAC Reciprocity

Missouri Certification #: 236

Montana Certification #: Cert 0074

**Charlotte Certification IDs** 

9800 Kincey Ave. Ste 100, Huntersville, NC 28078 North Carolina Drinking Water Certification #: 37706 North Carolina Field Services Certification #: 5342

North Carolina Wastewater Certification #: 12

**Asheville Certification IDs** 

2225 Riverside Drive, Asheville, NC 28804 Florida/NELAP Certification #: E87648 Massachusetts Certification #: M-NC030

North Carolina Drinking Water Certification #: 37712

Nebraska Certification: NE-OS-28-14

Nevada Certification: FL NELAC Reciprocity

New York Certification #: 11608

North Carolina Environmental Certificate #: 667

North Carolina Certification #: 12710 North Dakota Certification #: R-216 Oklahoma Certification #: D9947 Pennsylvania Certification #: 68-00547 Puerto Rico Certification #: FL01264 South Carolina Certification: #96042001 Tennessee Certification #: TN02974

Texas Certification: FL NELAC Reciprocity

US Virgin Islands Certification: FL NELAC Reciprocity Virginia Environmental Certification #: 460165
Wyoming Certification: FL NELAC Reciprocity

West Virginia Certification #: 9962C Wisconsin Certification #: 399079670

Wyoming (EPA Region 8): FL NELAC Reciprocity

South Carolina Certification #: 99006001 Florida/NELAP Certification #: E87627 Kentucky UST Certification #: 84 Virginia/VELAP Certification #: 460221

North Carolina Wastewater Certification #: 40 South Carolina Certification #: 99030001 Virginia/VELAP Certification #: 460222

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**SAMPLE ANALYTE COUNT** 

Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92300031001	T1-160603-1040-S3	EPA 1664B	JMS	1	PASI-C
		EPA 200.7	CKJ	1	PASI-O
		Trivalent Chromium Calculation	CKJ	1	PASI-O
		EPA 200.8	CKJ	10	PASI-O
		EPA 245.1	SH1	1	PASI-A
		SM 2540D	MJP	1	PASI-A
		EPA 218.7	AEM	1	PASI-O
		EPA 350.1	AES2	1	PASI-A
		SM 4500-CI-E	AES2	1	PASI-A
92300031002	T2-160603-1325-S3	EPA 1664B	JMS	1	PASI-C
		EPA 200.7	CKJ	1	PASI-O
		Trivalent Chromium Calculation	CKJ	1	PASI-O
		EPA 200.8	CKJ	10	PASI-O
		EPA 245.1	SH1	1	PASI-A
		SM 2540D	MJP	1	PASI-A
		EPA 218.7	AEM	1	PASI-O
		EPA 350.1	AES2	1	PASI-A
		SM 4500-CI-E	AES2	1	PASI-A



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

Method: EPA 1664B

**Description:** HEM, Oil and Grease **Client:** Golder\_Dominion\_Bremo

**Date:** June 06, 2016

#### **General Information:**

2 samples were analyzed for EPA 1664B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

# Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

#### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

#### Surrogates:

All surrogates were within QC limits with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

# **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

Method: EPA 200.7 Description: 200.7 MET ICP

Client: Golder\_Dominion\_Bremo

**Date:** June 06, 2016

#### **General Information:**

2 samples were analyzed for EPA 200.7. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

#### Sample Preparation:

The samples were prepared in accordance with EPA 200.7 with any exceptions noted below.

#### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

#### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

#### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

Method: Trivalent Chromium Calculation
Description: Trivalent Chromium Calculation
Client: Golder\_Dominion\_Bremo

**Date:** June 06, 2016

#### **General Information:**

2 samples were analyzed for Trivalent Chromium Calculation. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

# Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

#### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

#### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

# Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

Method: EPA 200.8

**Description:** 200.8 MET ICPMS **Client:** Golder\_Dominion\_Bremo

**Date:** June 06, 2016

#### **General Information:**

2 samples were analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

#### **Sample Preparation:**

The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

#### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

#### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

## Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

#### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

Method: EPA 245.1 Description: 245.1 Mercury

Client: Golder\_Dominion\_Bremo

**Date:** June 06, 2016

#### **General Information:**

2 samples were analyzed for EPA 245.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

#### Sample Preparation:

The samples were prepared in accordance with EPA 245.1 with any exceptions noted below.

#### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

#### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

#### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

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#### **PROJECT NARRATIVE**

Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

Method: SM 2540D

**Description:** 2540D TSS, Low-Level **Client:** Golder\_Dominion\_Bremo

**Date:** June 06, 2016

#### **General Information:**

2 samples were analyzed for SM 2540D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

#### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

#### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

#### **Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

Method: EPA 218.7

**Description:** Hexavalent Chromium by IC **Client:** Golder\_Dominion\_Bremo

**Date:** June 06, 2016

#### **General Information:**

2 samples were analyzed for EPA 218.7. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

# Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

#### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

#### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

# Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: WETA/58463

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 92300031001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1595783)
  - Chromium. Hexavalent



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

Method: EPA 350.1

Description: 350.1 Ammonia

Client: Golder\_Dominion\_Bremo

**Date:** June 06, 2016

#### **General Information:**

2 samples were analyzed for EPA 350.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

# Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

#### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

#### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

# Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

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#### **PROJECT NARRATIVE**

Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

Method: SM 4500-CI-E Description: 4500 Chloride

Client: Golder\_Dominion\_Bremo

**Date:** June 06, 2016

#### **General Information:**

2 samples were analyzed for SM 4500-Cl-E. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

#### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

# Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

#### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

#### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

#### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

# Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### **Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.



# **ANALYTICAL RESULTS**

Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

Date: 06/06/2016 05:01 PM

Sample: T1-160603-1040-S3	Lab ID: 923	300031001	Collected: 06/03/1	6 10:40	Received: 0	6/03/16 14:10	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
Field Data	Analytical Me	thod:						
Collected By	B. DIEHL			1		06/03/16 10:50	)	
Collected Date	06/03/16			1		06/03/16 10:50	)	
Collected Time	10:40			1		06/03/16 10:50		
Field pH	8.2	Std. Units	0.10	1		06/03/16 10:50	)	
HEM, Oil and Grease	Analytical Me	thod: EPA 16	64B					
Oil and Grease	ND	mg/L	5.0	1		06/04/16 12:07	7	
200.7 MET ICP	Analytical Me	thod: EPA 20	0.7 Preparation Met	hod: EP	A 200.7			
Tot Hardness asCaCO3 (SM 2340B	77700	ug/L	3300	1	06/04/16 12:46	06/04/16 17:00	)	
Trivalent Chromium Calculation	Analytical Me	thod: Trivaler	nt Chromium Calculat	tion				
Chromium, Trivalent	ND	ug/L	5.0	1		06/06/16 15:44	1 16065-83-1	
200.8 MET ICPMS	Analytical Me	thod: EPA 20	0.8 Preparation Met	hod: EP	A 200.8			
Antimony	ND	ug/L	5.0	1	06/04/16 12:46	06/04/16 16:34	1 7440-36-0	
Arsenic	37.4	ug/L	5.0	1	06/04/16 12:46	06/04/16 16:34	4 7440-38-2	
Cadmium	ND	ug/L	1.0	1	06/04/16 12:46	06/04/16 16:34	4 7440-43-9	
Copper	ND	ug/L	5.0	1		06/04/16 16:34		
_ead	ND	ug/L	5.0	1		06/04/16 16:34		
Nickel	ND	ug/L	5.0	1		06/04/16 16:34		
Selenium Silver	ND ND	ug/L ug/L	5.0 0.40	1 1		6 06/04/16 16:34 6 06/04/16 16:34		
Thallium	ND ND	ug/L ug/L	1.0	1		6 06/04/16 16:3 <sup>2</sup> 6 06/04/16 16:3 <sup>2</sup>		
Zinc	ND	ug/L	25.0	1		6 06/04/16 16:34		
245.1 Mercury	Analytical Me	thod: EPA 24	5.1 Preparation Met	hod: EP	A 245.1			
Mercury	ND	ug/L	0.10	1	06/04/16 13:00	06/04/16 15:38	3 7439-97-6	
2540D TSS, Low-Level	Analytical Me	thod: SM 254	0D					
Total Suspended Solids	1.2	mg/L	1.0	1		06/04/16 11:38	3	
Hexavalent Chromium by IC	Analytical Me	thod: EPA 21	8.7					
Chromium, Hexavalent	ND	ug/L	3.0	3		06/06/16 12:02	2 18540-29-9	M1
350.1 Ammonia	Analytical Me	thod: EPA 35	0.1					
Nitrogen, Ammonia	ND	mg/L	0.20	1		06/04/16 12:46	6 7664-41-7	
500 Chloride	Analytical Me	thod: SM 450	0-CI-E					
Chloride	19.3	mg/L	5.0	1		06/04/16 12:3	1 16887-00-6	
		5						



# **ANALYTICAL RESULTS**

Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

Date: 06/06/2016 05:01 PM

Sample: T2-160603-1325-S3	Lab ID: 92	300031002	Collected: 06/03/1	6 13:25	Received: 0	6/03/16 14:10	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qua
Field Data	Analytical Me	thod:						
Collected By	B. DIEHL			1		06/03/16 13:30	)	
Collected Date	06/03/16			1		06/03/16 13:30	)	
Collected Time	13:25			1		06/03/16 13:30		
Field pH	8.1	Std. Units	0.10	1		06/03/16 13:30	)	
HEM, Oil and Grease	Analytical Me	thod: EPA 16	64B					
Oil and Grease	ND	mg/L	5.0	1		06/04/16 12:07	7	
200.7 MET ICP	Analytical Me	thod: EPA 20	0.7 Preparation Met	hod: EP	A 200.7			
Tot Hardness asCaCO3 (SM 2340B	72100	ug/L	3300	1	06/04/16 12:46	06/04/16 17:04	4	
Trivalent Chromium Calculation	Analytical Me	thod: Trivaler	nt Chromium Calcula	tion				
Chromium, Trivalent	ND	ug/L	5.0	1		06/06/16 15:44	1 16065-83-1	
200.8 MET ICPMS	Analytical Me	thod: EPA 20	0.8 Preparation Met	hod: EP	A 200.8			
Antimony	ND	ug/L	5.0	1	06/04/16 12:46	06/04/16 16:37	7 7440-36-0	
Arsenic	29.2	ug/L	5.0	1	06/04/16 12:46	06/04/16 16:37	7 7440-38-2	
Cadmium	ND	ug/L	1.0	1		06/04/16 16:37		
Copper	ND	ug/L	5.0	1		06/04/16 16:37		
Lead	ND	ug/L	5.0	1 1		06/04/16 16:37		
Nickel Selenium	ND ND	ug/L ug/L	5.0 5.0	1		6 06/04/16 16:37 6 06/04/16 16:37		
Silver	ND ND	ug/L ug/L	0.40	1		6 06/04/16 16:37 6 06/04/16 16:37		
Thallium	ND	ug/L	1.0	1		06/04/16 16:37		
Zinc	ND	ug/L	25.0	1		06/04/16 16:37		
245.1 Mercury	Analytical Me	thod: EPA 24	5.1 Preparation Met	hod: EP	A 245.1			
Mercury	ND	ug/L	0.10	1	06/04/16 13:00	06/04/16 15:45	7439-97-6	
2540D TSS, Low-Level	Analytical Me	thod: SM 254	10D					
Total Suspended Solids	1.1	mg/L	1.0	1		06/04/16 11:39	)	
Hexavalent Chromium by IC	Analytical Me	thod: EPA 21	8.7					
Chromium, Hexavalent	ND	ug/L	3.0	3		06/06/16 12:4	1 18540-29-9	
350.1 Ammonia	Analytical Me	thod: EPA 35	0.1					
Nitrogen, Ammonia	ND	mg/L	0.20	1		06/04/16 12:5	1 7664-41-7	
4500 Chloride	Analytical Me	thod: SM 450	00-CI-E					
Chloride	16.3	mg/L	5.0	1		06/04/16 12:34	16887-00-6	



**BREMO WEEKLY PROCESS** Project:

Pace Project No.: 92300031

QC Batch: GCSV/25172 QC Batch Method:

Analysis Method:

**EPA 1664B** 

**EPA 1664B** 

Analysis Description:

Matrix: Water

1664 HEM, Oil and Grease

Associated Lab Samples:

92300031001, 92300031002

METHOD BLANK: 1748561

Associated Lab Samples: 92300031001, 92300031002

Blank

Parameter

Units

Result

Reporting Limit

Analyzed

Qualifiers

Oil and Grease

mg/L

ND

5.0 06/04/16 12:06

LABORATORY CONTROL SAMPLE:

Parameter

1748562

Spike Conc.

LCS Result

LCS % Rec % Rec Limits

Qualifiers

Oil and Grease

Units mg/L

40

37.7

94

78-114

MATRIX SPIKE SAMPLE:

Date: 06/06/2016 05:01 PM

1748563

Parameter

Units

92300031002 Result

Spike Conc.

MS Result

MS % Rec % Rec Limits

Qualifiers

Oil and Grease

mg/L

ND

40

38.8

97

78-114



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

Date: 06/06/2016 05:01 PM

QC Batch: MERP/9538 Analysis Method: EPA 245.1

QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury

Associated Lab Samples: 92300031001, 92300031002

METHOD BLANK: 1748550 Matrix: Water

Associated Lab Samples: 92300031001, 92300031002

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Mercury ug/L ND 0.10 06/04/16 15:34

LABORATORY CONTROL SAMPLE: 1748551

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Mercury ug/L 2.5 2.5 102 85-115

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1748552 1748553

MS MSD 92300031001 Spike Spike MS MSD MS MSD % Rec Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD Qual ug/L ND 2.5 70-130 Mercury 2.5 2.5 2.6 101 101 1



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

QC Batch: MPRP/30839 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET

Associated Lab Samples: 92300031001, 92300031002

METHOD BLANK: 1595441 Matrix: Water

Associated Lab Samples: 92300031001, 92300031002

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Tot Hardness asCaCO3 (SM 2340B ug/L ND 3300 06/04/16 16:37

LABORATORY CONTROL SAMPLE: 1595442

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Tot Hardness asCaCO3 (SM 2340B ug/L 82700 85700 104 85-115

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1595443 1595444

MS MSD 92300032001 Spike Spike MS MSD MS MSD % Rec Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD Qual Tot Hardness asCaCO3 (SM 77700 82700 167000 70-130 ug/L 82700 162000 108 102 3 2340B

20400

Date: 06/06/2016 05:01 PM

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

LABORATORY CONTROL SAMPLE:

Date: 06/06/2016 05:01 PM

QC Batch: MPRP/30840 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET

Associated Lab Samples: 92300031001, 92300031002

METHOD BLANK: 1595445 Matrix: Water

1595446

Associated Lab Samples: 92300031001, 92300031002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND -	5.0	06/04/16 16:30	
Arsenic	ug/L	ND	5.0	06/04/16 16:30	
Cadmium	ug/L	ND	1.0	06/04/16 16:30	
Copper	ug/L	ND	5.0	06/04/16 16:30	
Lead	ug/L	ND	5.0	06/04/16 16:30	
Nickel	ug/L	ND	5.0	06/04/16 16:30	
Selenium	ug/L	ND	5.0	06/04/16 16:30	
Silver	ug/L	ND	0.40	06/04/16 16:30	
Thallium	ug/L	ND	1.0	06/04/16 16:30	
Zinc	ug/L	ND	25.0	06/04/16 16:30	

Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony	ug/L	50	48.4	97	85-115	
Arsenic	ug/L	50	52.9	106	85-115	
Cadmium	ug/L	5	5.0	99	85-115	
Copper	ug/l	50	53.0	106	85-115	

Spike

Lead ug/L 50 50.6 101 85-115 Nickel 85-115 ug/L 50 52.1 104 Selenium 50 55.0 110 85-115 ug/L Silver 5 102 85-115 5.1 ug/L Thallium 50 51.7 103 85-115 ug/L 250 85-115 Zinc 267 107 ug/L

MATRIX SPIKE & MATRIX S	PIKE DUPLICAT	E: 15954	47		1595448						
			MS	MSD							
	923	300031002	Spike	Spike	MS	MSD	MS	MSD	% Rec		
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	Qual
Antimony	ug/L	ND	50	50	51.9	52.3	98	98	70-130		
Arsenic	ug/L	29.2	50	50	82.1	81.7	106	105	70-130	1	
Cadmium	ug/L	ND	5	5	5.0	4.9	101	99	70-130	2	
Copper	ug/L	ND	50	50	51.7	52.4	102	103	70-130	1	
Lead	ug/L	ND	50	50	51.4	51.0	103	102	70-130	1	
Nickel	ug/L	ND	50	50	51.8	52.6	102	103	70-130	1	
Selenium	ug/L	ND	50	50	54.0	53.2	105	103	70-130	1	
Silver	ug/L	ND	5	5	5.1	5.1	101	102	70-130	0	
Thallium	ug/L	ND	50	50	52.9	52.7	105	105	70-130	0	

LCS

LCS

% Rec

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

Date: 06/06/2016 05:01 PM

MATRIX SPIKE & MATRIX SPIR	KE DUPLICAT	E: 15954	47		1595448						
			MS	MSD							
	923	300031002	Spike	Spike	MS	MSD	MS	MSD	% Rec		
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	Qual
Zinc	ug/L	ND	250	250	261	261	104	104	70-130	0	



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

QC Batch: WET/45335 Analysis Method: SM 2540D

QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids

Associated Lab Samples: 92300031001, 92300031002

METHOD BLANK: 1748554 Matrix: Water

Associated Lab Samples: 92300031001, 92300031002

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Total Suspended Solids mg/L ND 1.0 06/04/16 11:37

LABORATORY CONTROL SAMPLE: 1748555

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers **Total Suspended Solids** mg/L 250 246 98 90-110

SAMPLE DUPLICATE: 1748556

Date: 06/06/2016 05:01 PM

Parameter Units Parameter Units Parameter Units Parameter End of the sult Parameter Parameter Parameter Units Parameter Result Result RPD Qualifiers Total Suspended Solids mg/L 1.2 1.2 0



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

Date: 06/06/2016 05:01 PM

QC Batch: WETA/58463 Analysis Method: EPA 218.7

QC Batch Method: EPA 218.7 Analysis Description: Chromium, Hexavalent IC

Associated Lab Samples: 92300031001, 92300031002

METHOD BLANK: 1595781 Matrix: Water

Associated Lab Samples: 92300031001, 92300031002

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Chromium, Hexavalent ug/L ND 1.0 06/06/16 11:36

LABORATORY CONTROL SAMPLE: 1595782

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chromium, Hexavalent ug/L .075 .073J 98 85-115

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1595783 1595784

MS MSD 92300031001 Spike Spike MS MSD MS MSD % Rec Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD Qual ug/L ND .76J .74J 85-115 Chromium, Hexavalent .22 .22 122 115 2 M1



Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

Date: 06/06/2016 05:01 PM

QC Batch: WETA/27829 Analysis Method: EPA 350.1

QC Batch Method: EPA 350.1 Analysis Description: 350.1 Ammonia

Associated Lab Samples: 92300031001, 92300031002

METHOD BLANK: 1748557 Matrix: Water

Associated Lab Samples: 92300031001, 92300031002

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Nitrogen, Ammonia mg/L ND 0.20 06/04/16 12:43

LABORATORY CONTROL SAMPLE: 1748558

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Nitrogen, Ammonia mg/L 4.9 98 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1748560 1748559 MS MSD 92300031001 Spike Spike MS MSD MS MSD % Rec Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD Qual

Parameter Units Result Conc. Conc. Result Result % Rec Limits RPD Qual

Nitrogen, Ammonia mg/L ND 5 5 5.0 5.0 99 99 90-110 0

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

90-110

1

94



#### **QUALITY CONTROL DATA**

Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

Chloride

Date: 06/06/2016 05:01 PM

QC Batch: WETA/27830 Analysis Method: SM 4500-CI-E
QC Batch Method: SM 4500-CI-E Analysis Description: 4500 Chloride

Associated Lab Samples: 92300031001, 92300031002

METHOD BLANK: 1748564 Matrix: Water

mg/L

Associated Lab Samples: 92300031001, 92300031002

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Chloride mg/L ND 5.0 06/04/16 12:29

19.3

LABORATORY CONTROL SAMPLE: 1748565

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Chloride mg/L 20 20.4 102 90-110

10

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1748566 1748567 MS MSD 92300031001 Spike Spike MS MSD MS MSD % Rec Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD Qual

10

28.9

28.7

97

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



#### **QUALIFIERS**

Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

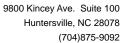
#### **LABORATORIES**

PASI-A Pace Analytical Services - Asheville
PASI-C Pace Analytical Services - Charlotte
PASI-O Pace Analytical Services - Ormond Beach

# **ANALYTE QUALIFIERS**

Date: 06/06/2016 05:01 PM

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.





# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: BREMO WEEKLY PROCESS

Pace Project No.: 92300031

Date: 06/06/2016 05:01 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92300031001 92300031002	T1-160603-1040-S3 T2-160603-1325-S3		FLD/ FLD/		
92300031001 92300031002	T1-160603-1040-S3 T2-160603-1325-S3	EPA 1664B EPA 1664B	GCSV/25172 GCSV/25172		
92300031001 92300031002	T1-160603-1040-S3 T2-160603-1325-S3	EPA 200.7 EPA 200.7	MPRP/30839 MPRP/30839	EPA 200.7 EPA 200.7	ICP/18438 ICP/18438
92300031001 92300031002	T1-160603-1040-S3 T2-160603-1325-S3	Trivalent Chromium Calculation Trivalent Chromium	ICP/18439 ICP/18439		
92300031001 92300031002	T1-160603-1040-S3 T2-160603-1325-S3	Calculation EPA 200.8 EPA 200.8	MPRP/30840 MPRP/30840		ICPM/12457 ICPM/12457
92300031001 92300031002	T1-160603-1040-S3 T2-160603-1325-S3	EPA 245.1 EPA 245.1	MERP/9538 MERP/9538	EPA 245.1 EPA 245.1	MERC/9171 MERC/9171
92300031001 92300031002	T1-160603-1040-S3 T2-160603-1325-S3	SM 2540D SM 2540D	WET/45335 WET/45335		
92300031001 92300031002	T1-160603-1040-S3 T2-160603-1325-S3	EPA 218.7 EPA 218.7	WETA/58463 WETA/58463		
92300031001 92300031002	T1-160603-1040-S3 T2-160603-1325-S3	EPA 350.1 EPA 350.1	WETA/27829 WETA/27829		
92300031001 92300031002	T1-160603-1040-S3 T2-160603-1325-S3	SM 4500-CI-E SM 4500-CI-E	WETA/27830 WETA/27830		

# ace Analytical \*

# Document Name:

# Sample Condition Upon Receipt(SCUR)

Document No.: F-MEC-CS-009-rev.02 Document Revised: 26FEB2016

Page 1 of 2

Issuing Authority: Pace Mechanicsville Quality Office

Page 2 of 2 for Internal Use ON

 $0 = A_{i}^{*} \otimes_{i} A_{i}^{*} \otimes_{i} A_{i}$ 

Sample Con dition Upon Client Name:				Project #: WO#: 92300031
Courier: Fed Ex Dur	)    S	ISPS		
☐ Commer <b>c</b> ial ☐ Pace		ther:		Client
Custody Seal Present? Yes No S	eals Intact?		/ Yes	□No
Packing Material: Bubble Wrap	[ ]Bubble Bag	· 🗆	None	Date/Initials Person Examining Contents 6-3-6
Thermometer: RMD001	Туре	of Ice:	Wet	
Correction Factor: 0.0°C Cooler Temp Corrected	(°C):	.	12.75-32	Biological Tissue Frozen? Yes No No N/A
Temp should be above freezing to 6°C  USDA Regulated Soil ( \sum N/A, water sample)		•		
Did samples or ginate in a quarantine zone within the Un	ited States: (	A, NY, or	r SC (checi	k maps)? Did samples originate from a foreign source (internationally,
☐Yes ☐No		*************		including Hawaii and Puerto Rico)? Yes No
Chain of Custo dy Present?				COMMENTS:
Chain of Custo dy Filled Out?	Yes	□No	92	
Chain of Custody Relinquished?	,Yes	□No		
Sampler Name and/or Signature on COC?	ýes	□No		
Samples Arrived within Hold Time?	Yes	□No	□n/a	
Short Hold Time Analysis (<72 hr)?	¥Yes	_ DNo	□n/a	5.
Rush Turn Around Time Requested?	Yes	No	□N/A	6.
Sufficient Volume?	Yes	□No	□N/A	7.
Correct Containers Used?		□No	□N/A	8.
-Pace Containers Used?	Yes	□No	□N/A	9.
Containers Intact?	Yes	□No	□N/A	
Filtered Volume Received for Dissolved Tests?	Yes	□No	□N/A	10.
	Yes	□No	N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	Yes	□No	□n/a	12.
-Includes Date/Time/ID/Analysis Matrix:  All containers needing acid/base preservation have been	IM.			
checked?	Yes	□No	□n/a	13.
All containers needing preservation are found to be in compliance with EPA recommendation?				
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH >9 Sulfide, NaOH>12 Cvanide)	Yes	□No	□n/a	
Exceptions: VOA, Coliform, TOC, Oil and Grease.	Atres		LIN/A	i i
DRO/8015 (water) DOC,LLHg Samples checked for dechlorination	□Yes	□No	□N/A	
Headspace in VOA Vials (>5-6mm)?	, 🔲 Yes	□No	N/A	14.
Trip Blank Present?	Yes	No	N/A	15.
Trip Blank Custody Seals Present?	∐Yes □Yes	□No	QN/A	16.
Pace Trip Blank Lot # (if purchased):	Lites	□No	□N/A	
CLIENT NOTIFICATION/RESOLUTION				Field Data Required? ☐Yes ☐No
Person Contacted:			*	ricio Data Regulieu: Lifes Lino
r cison contacted.				Date/Time:
Comments/Resolution:				
				,
Project Manager SCUPE D.	MG	i i		. 1. (
				Date: (
Project Manager SRF Review:	NMG			Date: (0   14   15
Note: Whenever there is a discrepancy affecting North Carolin Out of hold, incorrect preservative, out of temp, incorrect cont	a compliance	e samples	, a copy of	of this form will be sent to the North Carolina DEHNR Certification Office (i.e.
,	willers)			

			12/19/2008	All analyses	12	11	10	9	8 -	1 6	G	4	ω	2	4	ITEM#	TI (2		Requeste	Phone: 8	Email To:		Address:	Company:	Required C	
			12/19/2008	ADDITIONAL COMMENTS										T3-16060	T1-160603	SAMPLE ID  (A-Z, 0-9/,-) Sample IDs MUST BE UNIQUE	Section D Required Client Information		Requested Due Date/TAT:		Mormand@golder.com	Richmond, VA 23227	2108 W Laburr	Golder Associates	Clien	www.pacelabs.com
			- Control of the Cont	COMMENTS Golder-Page MSA dated										5-1335-20		A SAME	Valid Matrix Codes  MATRIX  DRINKING WATER DW		24 HOUR	Fax: 804-358-2900	der.com	23227	2108 W Laburnum Ave, Ste 200	ites		.com
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